VASIL'YEV, M. I.

Cranes, Derricks, etc.

Using cable cranes for replacing metal roofing of operating shops. Mekh. trud., rab. 6 no. 5, 1952.

9. Monthly List of Russian Accessions, Library of Congress, August 1952, Uncl.

VASIL'YEV, M.I.

BEZMAN, D.B.; VASIL'YEV, M.I.

Using MG-410 self-recording hydraulic manometers in test boring. (MIRA 11:5)
Biul. TSIIN tsvet. met. no.24:8-9 '57.
(Manometer) (Boring)

VASIL'YEV, M.I.

AUTHOR: Bezman, D.B., and Vasil'yev, M.I. 132-1-9/15

TITLE: Experiments with Automatic Recording Hydraulic Manometers of the Type MG-140 Used at Test Drilling Operations (Ob opyte izpol'zovaniya samopishushchikh gidravlicheskikh manometrov tipa MG-410 na razvedochnom burenii)

PERIODICAL: Razvedka i Okhrana Nedr., 1958, # 1, pp 49-50 (USSR)

ABSTRACT: Equipping hydraulically operated drill migs of the types " ЗИФ-300 " " ЗИФ-650А " and " ЗИФ-1200 А " with the automatically recording manometer " МГ-410 " made it possible to use the device for recording the pressure on the face from the start of drilling operations. Oil from the hydraulic system of the boring machine, conducted into " МГ-410 ", passes through a safety valve, which precludes pressures in excess of 25 atm. The device keeps control of the different stages of work and records the time required.
There is 1 figure.

ASSOCIATION: Trest "Uraltsvetrazvedka"

AVAILABLE: Library of Congress

Card 1/1

VASIL'YEV, M.I., inzh.

Assembly work in constructing concrete plants. Mekh.stroi. 15 no.9:3-7 S '58. (MIRA 11:10)
(Cranes, derricks, etc.) (Concrete plants)

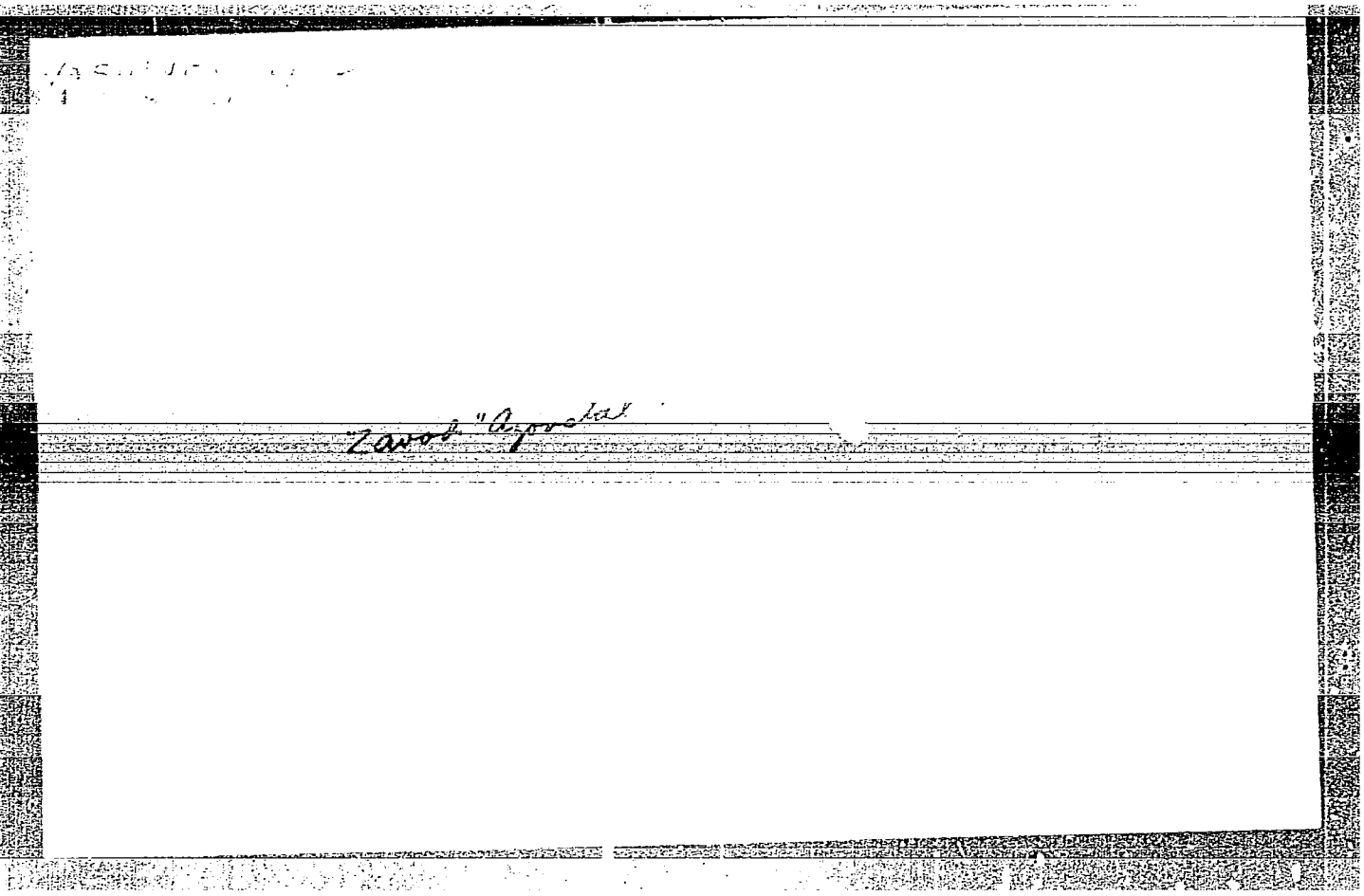
KARAPETOV, N.K., inzh.; VASIL'YEV, M.I., inzh.

Molds for making parts of houses of the 1-464 series. Stroi. i dor. mashinostr. 5 no.6:9-12 Je '60. (MIRA 13:7)
(Precast concrete)

VASIL'YEV, M.I., inzh.; ANIKIN, A.S., inzh.

Assembling industrial equipment for cement plants. Mont. i spets. rab. v stroi. 26 no.8:13-16 Ag '64. (MIRA 17:11)

1. Glavnoye upravleniye po montazhu tekhnologicheskogo oborudovaniya i proizvodstvu montazhnykh rabot Ministerstva stroitel'stva SSSR i TSentral'noye proyektno-konstruktorskoye otdeleniye Glavkhimmontazha.



VASIL'YEV, M.I.

Possibility of using high-boiling shale phenols in the manufacture of thermosetting phenol-formaldehyde resins. Khim. i tekh. gor. slan. i prod. ikh perer no.13:303-311 '64. (MIRA 18:9)

FEOFILOV, Ye.Ye.; KOKURIN, A.D.; GARNOVSKAYA, G.N. [deceased]; VASIL'YEV, M.L.

Sulfonation of phenols of the middle cut of shale tar. Khim. i tekh. gor. slan. i prod. ikh perer. no.8:210-218 '60. (MIRA 15:2)

(Phenols)
(Oil shales)
(Sulfonation)

ZABRODKIN, A.G.; ZELENIN, N.I.; LIYEVA, V.Yu.; FEOLILOV, Ye.Ye.; VASIL'YEV, M.L.

Plane tests of synthetic adhesives on a base of shale phenols boiling at temperature up to 300°. Khim. i tekh. gor. slan. i prod. ikh perer. no.10:246-252 '62. (MIRA 17:5)

Plant tests of synthetic adhesives on a base of shale tar phenols combined with triresol and boiled away at temperature above 300°. Ibid.:253-256

ZELENIN, N.I.; VASIL'YEV, M.L.; FEOFILOV, Ye.Ye.

Methods for utilizing high-boiling fractions of shale phenols. Khim. i tekh. gor. slan. i prod. ikh perer. no.9:199-203 '60. (MIRA 15:6)

(Phenols) (Oil shales)

ZABRODKIN, A.G.; LIYEVA, V.Yu.; VASIL'YEV, M.L.

Synthesis of gluing materials from high-boiling shale-oil phenols. Khim. i tekh. gor. slan. i prod. ikh perer. no.9:236-241 '60. (MIRA 15:6)

(Glue) (Oil shales) (Phenols)

ZELENIN, N.I.; VASIL'YEV, M.L.; FEOFILOV, Ye.Ye.

Use of high-boiling shale phenols for the production of plastic materials; thermosetting and activity of shale phenols. Khim. i tekh. gor. slan. i prod. ikh perer. no.9:204-213 '60. (MIRA 15:6)

(Plastics) (Oil shales) (Phenols)

20(5)
S/558/60/000/006/006/006
E032/E514

11.7300

AUTHOR: Vasil'yev, M.M.

TITLE: On the Reflection of a Spherical Shock-Wave from a Plane

PERIODICAL: Akademiya nauk SSSR. Vychislitel'nyy tsentr. Vychislitel'naya matematika; sbornik, No.6, 1960, pp.87-99

TEXT: Consider an explosion, i.e. the instantaneous emission of a finite quantity of energy in a gas at a time $t = 0$, pressure $p = 0$ and density $\rho = \rho_o$. Suppose further that the point A at which the explosion occurs at the distance h from the reflecting plane P. The point A will then emit a spherical shock-wave and the propagation of such a wave in an infinite space has been discussed by L. I. Sedov. All the linear dimensions will be expressed in units of h, the density in units of ρ_o and the time t in such a combination of the parameters that the law of motion of the incident wave can be given by

$$R = t^{2/5}, \qquad (1)$$

where R is the distance from A to the incident wave-front.

Card 1/10

On the Reflection of a Spherical Shock-Wave from a Plane

Suppose that at t = 1 the wave is tangential to the plane P at the point O and let us introduce the cylindrical coordinates r, z, φ having the origin at O and the z-axis perpendicular to the plane P. In these coordinates the equations of motion, energy and continuity are of the form

$$\frac{\partial u}{\partial t} + u\frac{\partial u}{\partial r} + v\frac{\partial u}{\partial z} + \frac{1}{\rho}\frac{\partial p}{\partial r} = 0, \qquad (2)$$

$$\frac{\partial v}{\partial t} + u\frac{\partial v}{\partial r} + v\frac{\partial v}{\partial z} + \frac{1}{\rho}\frac{\partial p}{\partial z} = 0, \qquad (3)$$

$$\frac{\partial p}{\partial t} + u\frac{\partial p}{\partial r} + v\frac{\partial p}{\partial z} - c^2\left(\frac{\partial \rho}{\partial t} + u\frac{\partial \rho}{\partial r} + v\frac{\partial \rho}{\partial z}\right) = 0, \qquad (4)$$

$$\frac{\partial \rho}{\partial t} + u\frac{\partial \rho}{\partial r} + v\frac{\partial \rho}{\partial z} + \rho\left(\frac{\partial u}{\partial r} + \frac{\partial v}{\partial z} + \frac{u}{r}\right) = 0, \qquad (5)$$

Card 2/10

S/558/60/000/006/006/006
E032/E514

On the Reflection of a Spherical Shock-Wave from a Plane

where $c = \sqrt{\gamma \frac{p}{\rho}}$ is the velocity of sound and u and v are the velocity components along the r and z axes; γ is the specific heat ratio. In the r,z,t space the reflected wave will then be represented by the surface (6)

$$z = f(r,t)$$

The conditions on the wave can be represented by

$$u_2 = u_1 + \frac{2}{\gamma+1}\left(\theta_1 - \frac{c_1^2}{\theta_1}\right)\sin\beta, \quad (7)$$

$$v_2 = v_1 - \frac{2}{\gamma+1}\left(\theta_1 - \frac{c_1^2}{\theta_1}\right)\cos\beta, \quad (8)$$

$$p_2 = p_1 + \frac{2}{\gamma+1}\rho_1(\theta_1^2 - c_1^2), \quad (9)$$

$$\rho_2 = \frac{(\gamma+1)\rho_1\theta_1^2}{2c_1^2 + (\gamma-1)\theta_1^2}, \quad (10)$$

Card 3/10

S/558/60/000/006/006/006
E032/E514

On the Reflection of a Spherical Shock-Wave from a Plane

where the subscript 1 refers to quantities in front of the shock-wave and the subscript 2 refers to quantities behind the shock-wave. In the above equations β = arc tan $(\partial f/\partial r)$ is the inclination of the wave to the r axis and Θ_1 is the velocity of propagation of the shock-wave relative to the gas in front of it. Differentiating Eq.(7) along the surface given by Eq.(6) in the two directions σ (t = const) and τ (normal to σ) one finds that

$$\frac{\partial u_2}{\partial r}\cos\beta + \frac{\partial u_2}{\partial z}\sin\beta = A,$$

$$\frac{\partial u_2}{\partial t} + N\left(\frac{\partial u_2}{\partial r}\sin\beta - \frac{\partial u_2}{\partial z}\cos\beta\right) = \beta,$$

where $N = \Theta_1 + u_1\sin\beta - v_1\cos\beta$. Similar equations are obtained by the analogous differentiation of Eqs.(8), (9) and (10). The righthand sides of these equations represent linear functions of the derivatives $\partial\beta/\partial\sigma$, $\partial\beta/\partial\tau$, $\partial\Theta_1/\partial\sigma$, $\partial\Theta_1/\partial\tau$ with coefficients

S/558/60/000/006/006/006
E032/E514

On the Reflection of a Spherical Shock-Wave from a Plane

depending on β, Θ_1 and functions obtained from the solution derived by L. I. Sedov in Ref.1. A simultaneous solution of these equations, together with Eqs.(2)-(5) written down for quantities with subscript 2, and the subsequent transition to the limit for $r \to 0$ and $t \to 1$, leads to expressions for the limiting values of the derivatives of u_2, v_2, p_2 and ρ_2 with respect to r, z and t in terms of N, $\partial N/\partial\tau$ and $K = -\partial\beta/\partial\sigma$. The limiting value of Θ_1 can be obtained from Eq.(8) by putting $v_2 = 0$:

$$(\Theta_1)_0 = \frac{\gamma+1}{4}\left[\sqrt{\frac{16(c_1^2)_0}{(\gamma+1)^2} + (v_1^2)_0} - (v_1)_0\right]. \qquad (11)$$

The quantities u_2, p_2 and ρ_2 for $r \to 0$ and $t \to 1$ can then be calculated from Eqs. (7), (9) and (10). Knowing the limiting value $N = N_0 = (\Theta_1)_0 + (v_1)_0$ and the position of the point of reflection at any time, one can determine the limiting value of the curvature of the reflecting wave. Simple calculations then lead to

Card 5/10

S/558/60/000/006/006/006
E032/E514

On the Reflection of a Spherical Shock-Wave from a Plane

the expression

$$K_o = -\frac{5}{2} N_o \qquad (12)$$

The limiting value of $\partial N/\partial \tau$ is obtained by putting $\partial v_2/\partial t = 0$. Substituting the values of N_o, K_o and $(\partial N/\partial \tau)_o$ into the expressions for the derivatives of u_2, v_2, p_2 and ρ_2, one can find the values of the derivates at $t = 1$. In this way one obtains the distribution of velocity, pressure and density behind the reflected wave on the first approximation in the form of a part of the Taylor series. Expanding $f(r,t)$ in Eq.(6) into a series in powers of r and $t - 1$ and retaining second order terms only, one obtains for t sufficiently close to unity the following expression for the form of the reflected wave on the first approximation:

$$z = N_o(t - 1) + \frac{1}{2}\left(\frac{\partial N}{\partial \tau}\right)_o (t - 1)^2 + \frac{K_o}{2} r^2 \qquad (13)$$

In order to obtain the second order derivatives, Eqs.(2)-(5) must be

On the Reflection of a Spherical Shock-Wave from a Plane

differentiated with respect to r, z and t and the conditions on the shock-wave must be differentiated once again along σ and τ. The system of equations obtained in this way must then be solved and the limiting procedure for $r \to 0$ and $t \to 1$ carried out. As a result one obtains expressions for the limiting values of the second derivatives of u_2, v_2, p_2, and ρ_2 with respect to r, z and t in terms of the functions determined earlier and also in terms of $\partial^2 N/\partial\sigma^2)_0$, $(\partial^2 N/\partial\tau^2)_0$ and $(\partial K/\partial\tau)_0$. Let us now differentiate the expression for the velocity of the wave

$$N = \frac{\frac{\partial f}{\partial t}}{\sqrt{\left(\frac{\partial f}{\partial r}\right)^2 + 1}} \qquad (14)$$

twice along σ and use the expression for the expansion of f(r,t) in powers of r. On going to the limit $r \to 0$ and $t \to 1$ we

Card 7/10

S/558/60/000/006/006/006
E032/E514

On the Reflection of a Spherical Shock-Wave from a Plane

find that

$$\left(\frac{\partial^2 N}{\partial \sigma^2}\right)_o = \left(\frac{\partial K}{\partial \tau}\right)_o - N_o K_o^2 \qquad (15)$$

Equating to zero the expressions for the derivatives $\partial^2 v_2/\partial r^2$ and $\partial^2 v_2/\partial t^2$ we obtain a system of equations defining $(\partial^2 N/\partial \sigma^2)_o$, $(\partial^2 N/\partial \tau^2)_o$ and $(\partial K/\partial \tau)_o$. On solving this system of equations one obtains the form of the wave on the second approximation. Knowing $(\partial^2 N/\partial \sigma^2)_o$, $(\partial^2 N/\partial \tau^2)_o$ and $(\partial K/\partial \tau)_o$ one can determine the limiting values of the second derivatives of u_2, v_2, p_2 and ρ_2 with respect to r, z and t for $r \to 0$, $t \to 1$ and to determine the velocity, pressure and density of the gas behind the reflected wave on the second approximation, i.e. taking into account second order terms. Further approximations can be obtained in a similar way. The present author has carried out numerical calculations up to the third order terms. The form of the reflected wave on the third

Card 8/10

On the Reflection of a Spherical Shock-Wave from a Plane

approximation is given by

$$z = N_0(t-1) + \frac{K_0}{2}r^2 + \frac{1}{2}\left(\frac{\partial N}{\partial \tau}\right)_0 (t-1)^2 + \frac{1}{2}\left(\frac{\partial K}{\partial \tau}\right)_0 (t-1)r^2 + \\ + \frac{1}{6}\left(\frac{\partial^2 N}{\partial \tau^2}\right)_0 (t-1)^3 + \frac{1}{24}\left[\left(\frac{\partial^2 K}{\partial \sigma^2}\right)_0 + 3K_0^3\right] r^4 + \\ + \frac{1}{4}\left(\frac{\partial^2 K}{\partial \tau^2}\right)_0 r^2 (t-1)^2 + \frac{1}{24}\left(\frac{\partial^3 N}{\partial \tau^3}\right)_0 (t-1)^4, \qquad (16)$$

where

$$K_0 = -\frac{1}{3}, \qquad N_0 = \frac{2}{15},$$

$$\left(\frac{\partial K}{\partial \tau}\right)_0 = -2{,}430, \quad \left(\frac{\partial N}{\partial \tau}\right)_0 = 1{,}010,$$

$$\left(\frac{\partial^2 K}{\partial \tau^2}\right)_0 = 0{,}5051, \quad \left(\frac{\partial^2 N}{\partial \tau^2}\right)_0 = -0{,}8893,$$

$$\left(\frac{\partial^2 K}{\partial \sigma^2}\right)_0 = 17{,}111, \quad \left(\frac{\partial^3 N}{\partial \tau^3}\right)_0 = 0{,}5608.$$

Card 9/10

20758

S/558/60/000/006/006/006
E032/E514

On the Reflection of a Spherical Shock-Wave from a Plane

It follows from Eq.(16) that when $\alpha \approx 13.9°$ (α is the angle of the incident wave to the r-axis at $z = 0$) the curvature of the reflected wave at the point of reflection is positive. The exact value of α at which the curvature changes sign is 14.1°. Knowing the form of the reflected shock-wave and the situation in front of it, one can use Eqs. (7) to (10) to calculate u_2, v_2, p_2 and ρ_2 immediately behind the reflected wave front. An analogous method can be used to investigate the neighbourhood of the point of reflection at any given time. The paper is concluded with numerical tables for the various quantities occurring in the above analysis. There are 5 figures, 5 tables and 2 Soviet references.

Card 10/10

VASIL'YEV, M.N. [Vasyl'iev, N.N.]; KOZLOVSKIY, I.D. [Kozlovs'kyi, I.D.]; VASIL'YEV, M.M. [Vasyl'iev, M.M.]

New types of Lugansk nitro-linoleum. Khim. prom. [Ukr.] no.2 (MIRA 17:7)
76-78 Ja-Mr'63

VASIL'YEV, M.N., inzh.

Analyzing the separation of suspensions in the [illegible] centrifuge with up to [illegible] Mekh. mashinostr. [illegible] (MIRA [illegible])
Ja'63

VASIL'YEV, N. N.[Vasyl'iev, N. N.]; GALANINA, R. S.[Halanina, R. S.];
VASIL'YEV, M. M.[Vasyl'iev, M. M.]

Nitrolinoleum parquet tile. Khim. prom.[Ukr.] no.1:82-87 Ja-Mr '62. (MIRA 15:10)

(Linoleum)

VASIL'YEV, M.M., inzh.

Automatic control of outdoor lighting. Bum.prom. 37 no.6:25 Je '62. (MIRA 15:6)

1. Bumazhnaya fabrika "Komsomolets".
(Factories--Lighting) (Automatic control)

S/044/62/000/006/084/127
B166/B112

24.4300
26.1330

AUTHOR: Vasil'yev, M. M.

TITLE: Reflection of a spherical shock wave from a plane

PERIODICAL: Referativnyy zhurnal. Matematika, no. 6, 1962, 33, abstract 6V156 (Vychisl. matematika, sb. 6, 1960, 87-99)

TEXT: An approximate method of calculating the regular reflection from a plane P of a spherical shock wave propagating from a point explosion is given. It is assumed that the explosion occurs at a distance h from the plane P and that the conditions of regular reflection are fulfilled. For instants of time close to the instant of contact ($t = 1$) of the shock wave with the plane P the solution of the reflection problem is sought in the form of segments of Taylor series. Thus, for a form of shock wave $z(r, t)$ it is assumed that

$$z = N_0 (t - 1) + N_1 (t - 1)^2 + \frac{1}{2} K_0 r^2 + \ldots,$$

where r is the distance from the symmetry axis passing through the point of contact, and N_0, N_1, and K_0 are the unknown quantities. Using boundary

Card 1/2

S/044/62/000/006/084/127
B166/B112

conditions on the shock waves and on the plane, as well as the gasdynamic equations, the author has given a method of finding the coefficients of the segments of the series for the unknown functions. More accurate values of the unknown quantities (taking into account terms of the order of $(t - 1)^2$) are calculated for the case of reflection of a strong shock wave, i.e., for the case where h is small enough. The results of these calculations are presented in the form of graphs and tables.
[Abstracter's note: Complete translation.]

ZAVERTAYLO, M.M.; VASIL'YEV, M.M.

Selecting the necessary heat-exchange surface of gas "pipe in pipe" heat exchangers for cooling gas. Gaz. delo no.1:3-5 '65. (MIRA 18:6)

1. Krasnodarskiy filial Vsesoyuznogo neftegazovogo nauchno-issledovatel'skogo instituta.

SOV/129-59-4-13/17

AUTHORS: Engineers Vasil'yev, M.M., and Polishchuk, A.P.

TITLE: Increasing the Hardness of Timber-Cutting Tools by High Frequency Hardening (Uprochneniye rezhushchego lesozagotovitel'nogo instrumenta zakalkoy T.V.Ch.)

PERIODICAL: Metallovedeniye i Termicheskaya Obrabotka Metallov, 1959, Nr 4, pp 55-57 (USSR)

ABSTRACT: Saw chains are series manufactured in three variants depending on the applications. Production of wear resistant and strong saw chains was solved by TsNIIME by producing cutting bits of a high hardness of 60-62R_C; through-hardening with high frequency current was applied. In the case of the saw chain PTs-15M the cutting elements were subjected to hardening. The high frequency hardening of the cutting elements penetrated to depths up to 3 mm; the sketch (Fig 1) gives a full picture of the depths of the hardened and the transient (thermally affected) zones, both of which are located above the bending point of the cutting elements thus ensuring the necessary high strength in the dangerous cross section itself. The current is fed from a 72 kW,130-200x10^3 kc/sec oscillator. The heating was effected by means of a loop inductor made of copper tubing and cooled internally with water. The heating

Card 1/3

Increasing the Hardness of Timber-Cutting Tools by High Frequency Hardening

temperature is monitored by means of a photo-electric pyrometer. Individual elements were heated singly for durations slightly over one second and, following that, they were dropped into an oil containing tank. After hardening the individual elements were tempered in an oil bath for 2 hours at 170°C. The high frequency heating was effected in accordance with two regimes with heating temperatures of 900 - 960°C and heating speeds of 130 - 150°C/sec. respectively. The temperature curve for heating according to the first-mentioned regime is graphed in Fig 2. On the basis of the obtained result it is concluded that high frequency hardening ensures in the given case a 2-3 fold increase in the wear resistance. For one of the types of saw chains discussed (PTs-15M) the author recommends high frequency hardening only for the cutting elements themselves, which should be carried out by means of specially built automatic hardening machines. The high frequency hardening increases the manufacturing cost of the product by 10 to 15% but this

Increasing the Hardness of Timber-Cutting Tools by High Frequency Hardening

is out-weighed by the fact that the life of the manufactured tools is doubled.

There are 2 figures and 1 table.

ASSOCIATIONS: VNII and TsNIIME

Card 3/3

VASIL'YEV, M.M., inzh.

Technical calculation of filtering centrifuges and centrifugal decanters with periodic action. Trudy NIIKHIMMASH no. 29:34-50 '59. (MIRA 14:5)

(Centrifuges)

VASIL'YEV, M.M., inzh.

Determining power consumption for the conveying of the speed of a rotor to the liquid phase of a suspension in a centrifugal decanter. (MIRA 14:5)
Trudy NIIKHIMMASH no. 29:51-65 '59.
(Centrifugation)

VASIL'YEV, M.M., inzh.

Intensifying filtering centrifuges. Trudy NIIKHIMMASH no.29:66-71 '59. (MIRA 14:5)
(Centrifuges)

VASIL'YEV, M.M.

Reflection of a spherical shock wave from a plane. Vych mat. no.6: 87-99 '60. (MIRA 13:10)

(Shock waves)

VASIL'YEV, M.N.

VASILBEV, M.N.

25127. VASILBEV, M. N. (Sev.-Kavkazsk. Trest) Iz Opyta Sostavleniya Orgkhozplanov Konnykh Zavodov Konevodstvo, 1949, No. 4, C. 38-39

SO: Letopis' No. 33, 1949

CHECHKIN, V.V.; VASIL'YEV, M.P.; GRIGOR'YEVA, L.I.; SMERDOV, B.I.

Damping of cyclotron oscillations in an inhomogenous plasma. Zhur. tekh. fiz. 31 no.9:1033-1035 S '61. (MIRA 14:8)

1. Fiziko-tekhnicheskiy institut AN USSR, Khar'kov.
(Plasma oscillations)

VASIL'YEV, Mikhail Petrovich; GRIGOR'YEV, V.N., otvetstvennyy redaktor; KOLOMIYTSEV, A.D., redaktor izdatel'stva; KOROVENKOVA, Z.A., tekhnicheskiy redaktor

[Mine haulage] Rudnichnyi transport. Moskva, Ugletekhizdat, 1956. 313 p. (MLRA 10:1)
(Mine haulage)

ALEKSEYEV, A.G.; VASIL'YEV, M.P.; MOZIN, I.V.

Device for measuring the rate of magnetic field variation in a proton synchrotron. Prib. i tekh. eksp. 7 no.4:236-239 Jl-Ag '62. (MIRA 16:4)

1. Nauchno-issledovatel'skiy institut elektrofizicheskoy apparatury Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR.
(Magnetic measurements) (Synchrotron)

27163
S/057/61/031/009/003/019
B109/B138

24.6714

AUTHORS: Chechkin, V. V., Vasil'yev, M. P., Grigor'yeva, L. I., Smerdov, B. I.

TITLE: Absorption of cyclotron oscillations in a heterogeneous plasma

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 9, 1961, 1033-1035

TEXT: Apparatus and results of measurement are described for the absorption of high-frequency energy in a hydrogen plasma produced in a quartz tube (5.5 cm diameter, 100 cm length) by a Penning discharge. Capacitor 2 microfarads, charged to 5 kv, maximum discharge time did not exceed a few microseconds. The plasma was under the action of a longitudinal magnetic field, also produced by a capacitor discharge to a solenoid (18 milliseconds quasisteady, 10^4 - $1.6 \cdot 10^4$ gauss). Measurements were made in the time interval of 300 - 1,000 microseconds after ignition of the plasma discharge. The plasma oscillations were excited by a 10.7 Mcps, 300-w coil (axial period λ = 11 cm) as described by G. N. Stix (Phys.

Card 1/4

Absorption of cyclotron ...

Fluids, 1, 308, 1958); the coil was pushed onto the quartz tube. Fig. 1 shows the results of measurement: dependence of the high-frequency power absorbed in the plasma on the magnetic field strength at various momerts after discharge ignition, i.e., at different ion densities (hydrogen pressure $6 \cdot 10^{-3}$ mm Hg). The authors interpret the course of the curve stating that the cyclotron oscillations with high densities are excited in the peripheral plasma layer and, moving to the axis, meet a layer with critical ion density, where they are absorbed. Fig. 2 shows this dependence for $1.3 \cdot 10^{-3}$ mm Hg; here, the ion density in the discharge is considerably lower, and cyclotron oscillations can be excited in the region of $H = H_0$ only. In all experiments, the ion temperature in the plasma hardly exceeded 1 ev. Under such conditions the cyclotron damping with H values where absorption occurs, is no longer important cf. R. Z. Sagdeyev, V. D. Shafranov (Fizika plazmy i problema upravlyayemykh termoyadernykh reaktsiy, IV, 430, 1958). But the absorption caused by collisions between unequal particles should still be very considerable. The authors thank K. D. Sinel'nikov, Academician AS UkrSSR, V. T. Tolok, and K. N. Stepanov

Absorption of cyclotron ...

for discussing the work. There are 2 figures and 5 references: 2 Soviet-bloc and 3 non-Soviet-bloc.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR Khar'kov
(Physicotechnical Institute AS UkrSSR, Khar'kov)

SUBMITTED: September 10, 1960

Fig. 1. Dependence of the absorbed power on the magnetic field strength.

Legend: The scale on the ordinate is given in relative units. The broken line denotes the magnetic field strength corresponding to the cyclotron resonance of an individual ion. 1 - 300 μsec after the beginning of discharge; 2 - 400; 3 - 500; 4 - 600; 5 - 700; 6 - 800; 7 - 900; 8 - 1,000 μsec.

Fig. 2. The same as in Fig. 1 for $1.3 \cdot 10^{-3}$ mm Hg. 1 - 300; 2 - 400; 3 - 500; 4 - 600; 5 - 700 μsec.

ACCESSION NR: AP4042945 S/0057/64/034/[illegible]/1531/1533

AUTHOR: Vasil'yev, M.P.; Grigor'yeva, L.I.; Smerdov, B.I.; Chechkin, V.V.

TITLE: Increase in the diffusion rate of a plasma at the ion cyclotron resonance

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.8, 1964, 1531-1533

TOPIC TAGS: plasma diffusion, cyclotron resonance, hydrogen plasma

ABSTRACT: The effect of a high-frequency azimuthal electric field on the decay rate of hydrogen plasmas in a magnetic field was investigated experimentally. V.V.Dolgopolov, K.N.Stepanov and the present authors have described the apparatus in detail elsewhere (ZhTF 34,No.6,1964). The plasmas were produced in a 6 cm diameter glass tube by a Penning discharge between cathodes separated by 83 cm. Thirty microseconds after the discharge, the plasma temperature had dropped below 1 eV but the charged particle density was still 1.7×10^{13} cm^{-3}. The subsequent rate of decay of the plasma was independent of the strength of the longitudinal magnetic field provided this was not less than 1.5 kOe. This is ascribed to predominance in the decay mechanism of recombination over diffusion to the walls. A 7.45 Mc field with negligible

1/3
Card

ACCESSION NR: AP4042945

longitudinal electric field component was applied to the decaying plasma by means of a section of an artificial helical LC line. When this high-frequency field was sufficiently strong, its application increased the decay rate of the plasma at all values of the static longitudinal magnetic field strength; the increase was particularly marked, however, at a magnetic field strength of 5.6 kOe, at which the ion Larmor frequency is some 15% greater than the frequency of the applied field. Weak high-frequency fields were found to decrease the plasma decay rate, but the decay rate was increased by fields exceeding a certain critical amplitude that increased with increasing pressure. The decrease of the decay rate in weak high-frequency fields is ascribed to heating of the plasma, and the increase in strong fields to enhancement of the plasma diffusion rate. The diffusion enhancement mechanism is not understood, but it is suggested that a drift instability due to nonuniform heating may be involved. The authors briefly discuss the effect of the observed phenomena on heating of plasmas at the ion cyclotron resonance under such conditions that the longitudinal electric field component is significant. "We tender our gratitude to V.T.Tolok for discussing the work and for valuable remarks." Orig.art.has: 3 figures.

2/3
Card

ACCESSION NR: AP4042945

ASSOCIATION: none

ENCL: 00

SUBMITTED: 29Aug63

OTHER: 001

SUB CODE: ME, NP

NR REF SOV: 004

Card
3/3

CHECHKIN, V.V.; VASIL'YEV, M.P.; GIRGOR'YEVA, L.I.; LONGINOV, A.V.; SMERDOV, B.I.

Resonance heating of a plasma by a strong high-frequency field. Pis'. v red. Zhur. eksper. i teoret. fiz. 2 no.9:418-422 N '65. (MIRA 18:12)

1. Submitted September 7, 1965.

BR

ACCESSION NR: AP4040298 S/0057/64/034/006/0984/0992

AUTHOR: Vasil'yev,M.P.; Grigor'yeva,L.I.; Dolgopolov,V.V.; Smerdov,B.I.; Stepanov, K.N.; Chechkin,V.V.

TITLE: Experimental investigation of the absorption of high frequency energy by a plasma at frequencies near cyclotron resonance. 2.

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.6, 1964, 984-992

TOPIC TAGS: plasma, plasma heating, cyclotron resonance phenomena, electromagnetic wave absorption, hydrogen plasma

ABSTRACT: The absorption of high frequency energy by a hydrogen plasma at frequencies near the ion cyclotron resonance was investigated experimentally. The plasma was formed by discharge of a 6 microfarad capacitor, charged to 3 to 5 kV, between two cathodes at the ends of an 88 cm long 6 cm diameter discharge tube and an annular anode located 6 cm from one of the cathodes. The period of this system was 35 microsec. A longitudinal magnetic field up to 6.5 kOe was produced by discharge of a 0.006 farad capacitor bank through an appropriate solenoid. The period was 18 millisec, and the field could be considered constant during the 500 microsec observa-

Card 1/3

ACCESSION NR: AP4040298

tion time. The magnetic field strength increased at the ends of the discharge tube, thus providing magnetic mirrors for confinement of the plasma. The high frequency electromagnetic field was produced by currents in a 7 cm diameter 7/8 cm pitch helix, coaxial with the discharge tube and loaded every 7 cm by a 450 micromicrofarad capacitor. This line was coupled to a pulsed self-excited oscillator operating at 7.5 megacycles/sec. The density of the plasma was determined with an 8.1 mm microwave interferometer. The electron temperature was determined from the intensity ratio of HeI 4921 to HeI 4713, 5% He having been added to the hydrogen to provide these lines. The ion temperature was determined from the Doppler broadening of Hβ. The power absorbed by the plasma was determined by measuring the power delivered by the oscillator to the helical line. The maximum power absorbed by the plasma in these experiments was 18 kW. During the flow of the discharge current, the ion temperature rose to several eV and the electron temperature to several tens of eV. The temperatures fell rapidly after the discharge ceased, and the electron temperature was less than 1 eV after 60 microsec. During about the first 100 microsec, when the plasma density was greater than 5×10^{13} cm^{-3}, a non-resonant absorption of high frequency energy was observed, the nature of which is not understood. The expected resonance absorption occurred after the density had fallen below 5×10^{13} cm^{-3}. The

Card 2/3

resonance absorption was investigated and compared with the theory published by the present authors in the preceding paper (ZhTF 34,974,1964 /See Abstract AP4040297/). The conditions of the plasma were such that the absorption was entirely by collision The relation between plasma density and the shift of the absorption peak from the Larmor frequency was in good agreement with the theory. The width of the absorption band varied more rapidly with plasma density than the theory predicts. The energy balance in the plasma is discussed. The energy absorbed by the ions was rapidly transferred to the electrons and lost. It is concluded that significant heating can be achieved with the present method only by increasing the power or providing supplementary heating by the electrons. "The authors express their gratitude to V.T. Tolok, V.I.Konenko, O.S.Pavlichenko, V.A.Suprunenko and V.T.Pilipenko for assisting in the work and discussing the results." Orig.art.has: 5 formulas, 8 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 09May63 DATE ACQ: 19Jun64 ENCL: 00

SUB CODE: ME NR REF SOV: 007 OTHER: 003

Card 3/3

S/0057/64/034/006/0974/0983

ACCESSION NR: AP4040297

AUTHOR: Vasil'yev,M.P.; Grigor'yeva,L.I.; Dolgopolov,V.V.; Smerdov,B.I.; Stepanov, K.N.; Chechkin,V.V.

TITLE: On the absorption of high frequency energy by a plasma at frequencies near ion cyclotron resonance. 1.

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.6, 1964, 974-983

TOPIC TAGS: plasma, plasma heating, cyclotron resonance phenomena, electromagnetic wave absorption

ABSTRACT: The absorption of electromagnetic waves by a plasma at frequencies near the ion cyclotron resonance, discussed by T.H.Stix (Phys.Rev.106,1146,1957) as a means for heating a plasma, is treated theoretically for a cylindrical plasma filament of constant density. The high frequency electromagnetic field is assumed to be produced by traveling waves in a helical winding surrounding the plasma filament. The slight modifications required when the excitation is by standing waves in the helix are derived in an appendix. Damping both by ion collision and by cyclotron absorption, the process inverse to cyclotron radiation (magnetic bremsstrahlung),

Card 1/2

ACCESSION NR: AP4040297

are included in the treatment. A general expression for the energy flux is derived, and this is simplified and discussed in more detail for a number of limiting cases. The curve of absorption versus frequency is asymmetric, and the maximum absorption occurs at a frequency somewhat less than the Larmor frequency. The absorption of the slightly damped extraordinary wave is discussed. This can become important when the skin depth is too small to permit adequate penetration of the ordinary wave. The resonance, however, is very sharp, and it might be difficult to maintain adequate frequency control. Excitation of a plasma containing two ion species at the Larmor frequency of one of them produces a relative motion of the two ion species of the type discussed by S.J.Buchsbaum (Phys.Fl.3,418,1960) in connection with the low frequency hybrid resonance. "The authors express their deep gratitude to A.I. Akhiyezer and K.D.Sinel'nikov for valuable advice and discussions of the work."
Orig.art.has: 40 formulas and 2 figures.

ASSOCIATION: none

SUBMITTED: 15Mar63 DATE ACQ: 19Jun64 ENCL: 00

SUB CODE: ME NR REF SOV: 008 OTHER: 004

Card 2/2

ACCESSION NR: AP4041998 S/0057/64/034/007/1231/1236

AUTHOR: Vasil'yev, M.P.; Grigor'yeva, L.I.; Dolgopolov, V.V.; Smerdov, B.I.; Stepanov, K.N.; Chechkin, V.V.

TITLE: On the cyclotron resonance in a nonuniform plasma cylinder

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.7, 1964, 1231-1236

TOPIC TAGS: plasma, nonuniform plasma, cyclotron resonance, plasma heating

ABSTRACT: The heating of a cylindrical plasma by resonance absorption at the ion Larmor frequency (T.H.Stix,Phys.Fl.1,308,1958) is discussed theoretically for the case when the plasma temperature and density may vary with distance from the axis. It is assumed that the external high frequency field is produced by travelling waves of current on a cylindrical surface coaxial with the plasma cylinder, and that the magnetic pressure in the plasma is large compared with the kinetic pressure. The thermal motion of the particles tranvservely to the magnetic field is neglected. Expressions for the power absorbed are derived by a perturbation method for the four cases when the plasma is either so hot that the effect of collisions may be neglected or so cold that the collisions are of overwhelming importance, and either the

Card 1/2

ACCESSION NR: AP4041998

density of the plasma is low or the radius of the plasma cylinder is small compared with the wavelength. The absorption curve of a low density plasma is shown to be symmetric about the cyclotron frequency, but the maximum absorption of a dense plasma filament is found to occur at a lower frequency. The theoretical absorption curves for a cold plasma are reported to be in good agreement with recent experimental data of the present authors (ZhTF 34,No.6,1964). If the density of a cold plasma filament is independent of distance from the axis, the absorption curve is symmetric about the displaced maximum. If, however, the plasma filament is not uniform, the absorption curve becomes asymmetric. The asymmetry of the absorption curves observed earlier by most of the present authors (V.V.Chechkin, M.P.Vasil'yev, L.I.Grigor'yeva and B.I.Smerdov,ZhTF 31,1033,1961) is ascribed to the nonuniform density of the plasma filaments. "In conclusion, the authors thank A.I.Akhezer for his interest in the work and for discussing the results." Orig.art.has: 36 formulas a 2 figures.

ASSOCIATION: none

SUBMITTED: 09May62 ENCL: 00

SUB CODE: ME NR REF SOV: 004 OTHER: 001

Card 2/2

L 9283-66 EWT(1)/ETC/EPF(n)-2/EWG(m) IJP(c) WW/GG/AT

ACC NR: AP6000738 SOURCE CODE: UR/0386/65/002/009/0418/0422

AUTHOR: Chechkin, V. V. (44,55); Vasil'yev, M. P. (44,55); Grigor'yeva, L. I. (44,55); Longinov, A. V. (44,55); Smerdov, B. I. (44,55)

81
03

ORG: none

TITLE: Resonance heating (21,44,55) of plasma by means of a strong high-frequency field

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 9, 1965, 418-422

TOPIC TAGS: plasma heating (21,44,55), dense plasma, magnetic energy absorption, acoustic wave, hf field, electric field, magnetic field

ABSTRACT: An investigation was made of the heating of a dense plasma by powerful short high-frequency pulses when in plasma a fast magnetoacoustic wave ($\Omega_e >> \omega_e$, $\omega_i < \omega << \omega_e$, where Ω_e is the plasma electron frequency, ω_i, ω_e are cyclotron frequencies of ions and electrons, respectively, and ω is the operating frequency) is generated by means of resonance. The investigations were carried out on a disintegrating plasma present in a quasi-constant longitudinal magnetic field with an intensity reaching 6000 Oe. The plasma was generated by a pulse discharge with oscillating electrons in hydrogen and helium at a pressure of 10^{-3} mm Hg. The coefficient of energy transfer (the ratio of the energy absorbed by the plasma to the total energy stored in the circuit) of an h-f field from the circuit to the plasma was measured. The dependence of the coefficient on the intensity of a

Card 1/2

2

L 9283-66

ACC NR: AP6000738

quasi-magnetic field for different values of the initial electron density shows that the absorption of energy of an h-f field by the plasma has a resonance character, its maximum corresponding to a frequency ω, which is in the range $\omega_i < \omega < \sqrt{\omega_i \omega_e} \ll \omega_e$. A similar dependence was obtained for a helium plasma. The dependence of the transfer coefficient, the electron temperature, and the increase of electron density on the intensity of the magnetic field shows that the electron temperature T_e rises when the energy absorbed by the plasma increases, reaching approximately 60 ev. At the same time, the density of electrons also increases and the degree of ionization approaches 100%. The temperature of ions T_i is approximately 30 ev. The heating of the plasma takes a short time: at maximum absorption the amplitudes of h-f oscillations in the circuit decrease by 2.7 times per $\sim$0.5 μsec, i. e., during 2—3 oscillation periods; without plasma this decrease takes approximately 11 periods. The calculated damping decrement $\gamma_{exp} \simeq 6.5 \times 10^{-2}\omega$ (from the rate of the decrease in the amplitude oscillation in the circuit) exceeds the damping decrement of the magnetoacoustic waves, which is subjected to Coulomb losses, by more than two orders. The temperature, calculated from the energy balance under the assumption that the entire energy absorbed by the plasma is spent on its heating, is equal to $\sim$ 90 ev, which is in agreement with experimental data. Orig. art. has: 2 figures. [JA]

SUB CODE: 20/ SUBM DATE: 07Sep65/ ORIG REF: 009/ OTH REF: 001/ ATD PRESS: 4153

Card 2/2

ACCESSION NR: AT4036046 S/2781/63/000/003/0096/0109

AUTHORS: Vasil'yev, M. P.; Grigor'yeva, L. I.; Dolgopolov, V. V.; Smerdov, B. I.; Stepanov, K. N.; Chechkin, V. V.

TITLE: Absorption of high-frequency energy by a plasma near ion cyclotron resonance. I.

SOURCE: Konferentsiya po fizike plazmy* i problemam upravlyayemogo termoyadernogo sinteza. 3d, Kharkov, 1962. Fizika plazmy* i problemy* upravlyayemogo termoyadernogo sinteza (Plasma physics and problems of controlled thermonuclear synthesis); doklady* konferentsii, no. 3. Kiev, Izd-vo AN UkrSSR, 1963, 96-109

TOPIC TAGS: cyclotron resonance phenomena, plasma heating, plasma thermal excitation, plasma magnetic field interaction, microwave plasma

ABSTRACT: Cyclotron absorption of electromagnetic waves excited by

Card 1/3

ACCESSION NR: AT4036046

current flowing in a coil surrounding a plasma cylinder are considered. The heating of a plasma by cyclotron excitation of strongly damped (ordinary) and weakly damped (extraordinary) waves is discussed. General expressions are derived for the power absorbed by the plasma (for the energy flux inside the plasma per unit length of the plasma cylinder). Since the general expressions are rather complicated, a few limiting cases are considered, namely when the wave frequency is close to the ion cyclotron frequency, high ion-gas temperature, long-wave oscillations, and short-wave oscillations. The case of a low density plasma is also considered. Other topics touched upon are the influence of collisions on the heating of the plasma, the excitation of weakly damped (extraordinary waves in a plasma cylinder, and the heating of a plasma consisting of a mixture of two species of ions (such as deuterium and tritium. Orig. art. has: 2 figures and 24 formulas.

ASSOCIATION: None

Card 2/3

ACCESSION NR: AT4036046

SUBMITTED: 00	DATE ACQ: 21May64	ENCL: 00
SUB CODE: ME	NR REF SOV: 011	OTHER: 004

Card 3/3

ACCESSION NR: AT4036047 S/2781/63/000/003/0109/0117

AUTHORS: Brzhechko, M. V.; Vasil'yev, M. P.; Grigor'yeva, L. I.; Dolgopolov, V. V.; Loginov, A. S.; Pavlichenko, O. S.; Smerdov, B. I.; Stepanov, K. N.; Chechkin, V. V.

TITLE: Absorption of high-frequency energy by a plasma near ion cyclotron resonance, II.

SOURCE: Konferentsiya po fizike plazmy* i problemam upravlyayemogo termoyadernogo sinteza. 3d, Kharkov, 1962. Fizika plazmy* i problemy* upravlyayemogo termoyadernogo sinteza (Plasma physics and problems of controlled thermonuclear synthesis); doklady* konferentsii, no. 3, Kiev, Izd-vo AN UkrSSR, 1963, 109-117

TOPIC TAGS: cyclotron resonance phenomena, plasma heating, plasma thermal excitation, plasma magnetic field interaction, microwave plasma, discharge plasma, plasma source

Card 1/4

ACCESSION NR: AT4036047

ABSTRACT: This is the second part of a two-part paper and is devoted to an experimental check on the absorption of high-frequency energy by a plasma under conditions of ion cyclotron resonance, and a check on the theoretical deductions of the first part of the paper. The system used to feed the high-frequency power into the plasma is an artificial LC line fed at a high harmonic. This system is claimed to have several advantages over others. The source of high-frequency power was a self oscillator specially developed for the excitation of the line. The plasma was produced by a pulsed Penning discharge in a magnetic field in hydrogen ($H \leq 0.8$ Tesla). Considerable loading of the generator by the plasma took place near ion cyclotron resonance, accompanied by an increased intensity of the glow of the H_β line in the discharge. The shift in the maxima of the load curve away from the resonant value of the magnetic field, and also the form of this curve, are in agreement with the results of the theoretical part of the paper. The system for the supply of the high-frequency energy to the plasma and the experimental setup

Card 2/4

ACCESSION NR: AT4036047

are described in detail. It is pointed out that since the plasma temperature did not exceed 10^4 K in the experiments, the ion cyclotron damping is negligibly small and the absorption of high-frequency energy is only due to the collision between the ions and the electrons. The Penning discharge used in the investigation was not found to be as efficient as that elsewhere. The data offer evidence that the LC line is a highly effective system of transmitting high-frequency energy from the generator to a plasma in the case of ion cyclotron resonance. "The authors are grateful to K. D. Sinel'nikov and V. T. Tolok for a discussion of the work. Orig. art. has: 6 figures and 7 formulas.

ASSOCIATION: None

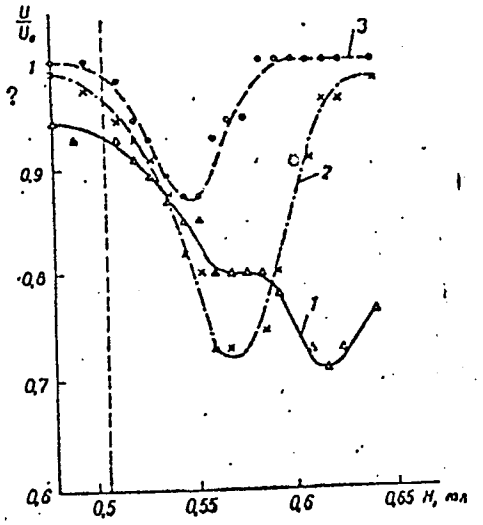
SUBMITTED: 00 DATE ACQ: 21May64 ENCL: 01

SUB CODE: ME NR REF SOV: 003 OTHER: 002

Card 3/4

ENCLOSURE:01

ACCESSION NR: AT4036047



Tesla

Dependence of the amplitude of the high-frequency voltage on the line (in relative units) on the magnetic field intensity at differnt instants of time following the discharge ignition: 1 - 200 μsec, 2 - 300 μsec, 3 - 400 μsec.

Card 4/4

VASIL'YEV, M.P.; GRIGOR'YEVA, L.I.; DOLGOPOLOV, V.V.; SMERDOV, B.I.; STEPANOV, K.N.; CHECHKIN, V.V.

Absorption of high-frequency energy by a plasma near the frequency of ion cyclotron resonance. Pt.1. Zhur. tekh. fiz. 34 no.6:974-983 Je '64.

Experimental study of the absorption of high-frequency energy by a plasma near the frequency of ion cyclotron resonance. Part 2. Ibid.:984-992 (MIRA 17:9)

VASIL'YEV, M.P.; GRIGOR'YEVA, L.I.; DOLGOPOLOV, V.V.; SMERDOV, B.I.; STEPANOV, K.N.; CHECHKIN, V.V.

Cyclotron resonance in an inhomogeneous plasma cylinder. Zhur. tekh. fiz. 34 no.7:1231-1236 Jl '64 (MIRA 17:8)

VASIL'YEV, M.P.; GRIGOR'YEVA, L.I.; SMERDOV, B.I.; CHECHKIN, V.V.

Accelerated diffusion of a plasma in ion cyclotron resonance.
Zhur. tekh. fiz. 34 no.8:1531-1533 Ag '64. (MIRA 17:9)

VASIL'YEV, M.P.; SPIVAK, V.M.

Efficient method of transporting and piling ck in the Karaganda Basin. Nauch. trudy KNIUI no.13:278-283 '64 (MIRA 18:1)

VASIL'YEV, M.P.; POPLAVSKIY, V.G.

Method of calculating pressure of pulp conduits. Nauch. trudy KNIUI no.13:283-288 '64 (MIRA 18:1)

VASIL'YEV, Mikhail Petrovich; ALOTIN, Leonid Mikhaylovich; VINNIK, N.A., inzh., retsenzent; GONCHAREVICH, I.F., kand. tekhn. nauk, retsenzent; SHELKOVYY, A.A., inzh., retsenzent

[Mine haulage] Rudnichnyi transport. 2. izd., dop. i perer. Moskva, Nedra, 1964. 376 p. (MIRA 17:9)

40763
S/120/62/000/004/044/047
E192/E382

24.6800

AUTHORS: Alekseyev, A.G., Vasil'yev, M.P. and Mozin, I.V.

TITLE: An instrument for measuring the rate of change of the magnetic field of the proton synchrotron

PERIODICAL: Pribory i tekhnika eksperimenta, no. 4, 1962, 236 - 239

TEXT: The instrument was designed for the 7 GeV proton synchrotron and it permits measurement of the reproducibility of the field-change rate and its absolute magnitude with an accuracy of 0.1%. The device is based on the potentiometric measurement of the e.m.f:

$$E = - kdB/dt$$

induced in the measuring coil. The measuring coils consists of a number of series-connected turns situated in the yokes of the electromagnets. The voltage U_K from the coil is applied to the input device 1 (see Fig. 1, which shows a block diagram of the instrument), where the signal is compared with the voltage of a reference element 2 . The comparison is performed

Card 1/3

An instrument for ....

during the whole time interval occupied by the induced pulse, the duration of the pulse being proportional to the rate of rise of the magnetic field. The switching device 4 selects the duration and instant of the measurement and transmits the difference signal through the amplifier 3 to the recorder 5 . The switching device is actuated by the cycle initiation pulse U_u .

The input circuit of the system consists of a filter, a reference-voltage source and a voltage divider. The switching device 4 receives the initiation pulse from a permalloy pick-up situated in the electromagnet. The pulse is amplified, then applied to a phantastron delay circuit. The trailing edge of the phantastron pulse determines the instant of commencing the measurement. The delay can be varied from 10 μs to 1.5 sec. The indicating device of the instrument is in the form of a simple vacuum-tube voltmeter. There are 4 figures.

ASSOCIATION: Nauchno-issledovatel'skiy institut elektrofizicheskoy apparatury GKAE (Scientific Research Institute of Electrophysical Equipment GKAE)

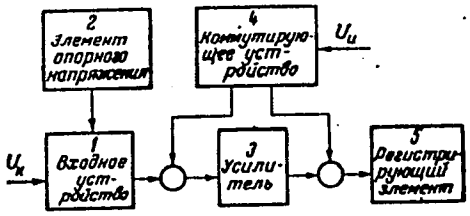
SUBMITTED: April 10, 1962

Card 2/3

S/120/62/000/004/044/047
E192/E382

An instrument for ....

Fig. 1:



Card 3/3

ACC NR: AT6020563 (N) SOURCE CODE: UR/0000/65/000/000/0015/0026

AUTHOR: Chechkin, V. V.; Vasil'yev, M. P.; Grigor'yeva, L. I.; Smerdov, E. I.

ORG: none

TITLE: Absorption of high frequency energy by plasma in the ion cyclotron resonance in strong high frequency fields

SOURCE: AN UkrSSR. Vysokochastotnyye svoyatva plazmy (High frequency properties of plasma). Kiev, Naukovo dumka, 1965, 15-26

TOPIC TAGS: plasma heating, plasma oscillation, plasma velocity, plasma density, cyclotron resonance, ion beam, electron collision

ABSTRACT: The present work continues the study of the absorption of high frequency waves by a plasma in the ion cyclotron resonance. The conditions for heating of plasma by this method and the physical processes which occur in various regimes are briefly reviewed. The nature of energy absorption is studied in the experiment with a high frequency wave applied to the plasma with a density of 10^{13} electrons/cm^3 and an axial current flow of 30 A/cm^2. It is shown that the absorption of the wave depends on the interaction between ions and electrons of the plasma. This result is described by equations derived for the case of absorption by collisions. In the experiments where the electric field of the wave exceeded the critical value (which determines the mul-

Card 1/2

ACC NR: AT6020563

mum absorption for two-body collisions), the effective collision frequency increased strongly. This increase is attributed to the deceleration of the directed ion beam in the cyclotron wave by high frequency plasma oscillations induced by ion beams with velocities exceeding the thermal velocity of the plasma. The experimentally determined effective collision frequency is within an order of magnitude of that arising from the above mechanism. Orig. art. has: 11 formulas, 3 figures.

SUB CODE: 20/ SUBM DATE: 19Nov65/ ORIG REF: 013/ OTH REF: 002

Card 2/2 vmb

VASIL'YEV, M.S.

Periodic checking of high-voltage equipment. Avtom. telem. i sviaz' 3 no.8:40 Ag '59. (MIRA 13:2)

1. Inzhener avtoblokirovki Demskoy distantsii signalizatsii i svyazi Kuybyshevskoy dorogi.
(Electric transformers)
(Insulating oils)

VASIL'YEV, M.S., elektromekhanik

Concerning certain shortcomings of recently manufactured cab signaling apparatus. Avtom., telem. i sviaz' 5 no.12:34 D '61. (MIRA 14:12)

1. Ispytatel'naya stantsiya avtomaticheskoy lokomotivnoy signalizatsii stantsii Dema Kuybyshevskoy dorogi.
(Railroads--Signaling) (Railroads--Communication systems)

VASIL'YEV, M.T.; KRASOVSKIY, G.P.

For an annual output of 400 bubic meters of lumber per worker.
Mech.trud.rab. 9 no.11:32-35 N '55. (MLRA 9:2)

1.Direktor Novo-Lyalinskogo lespromkhoza (for Vasil'yev). 2.
Glavnyy inzhener Novo-Lyalinskogo lespromkhoza (for Krasovskiy)
(Lumbering)

Vasil'ev, M. V., ed.

English-Russian and Russian-English marine dictionary, edited by Captain M. V. Vasiliev. Moscow, Leningrad, The State transport publishing house, 1937. 318 p. (38-1593)

V24.S45

1. Naval art and science - Dictionaries.
2. English language - Dictionaries - Russian
3. Russian language - Dictionaries - English.
I. Vasil'ev, M. V. ed.

VASIL'YEV, M.V. (Leningrad)

Twelve thousand newborn. Zdorov'e 4 no.3:2-3 Mr '58.
(NESTEROVA, ALEKSANDRA DMITRIEVNA, 1889-) (MIRA 11:3)

GULEV, Yakov Fedorovich, kand.tekhn.nauk; VASIL'YEV, M.V., inzh., red.; VERINA, G.P., tekhn.red.

[Handbook for the baggage handler] Spravochnik bagazhnogo rabotnika. Izd.2., ispr. i dop. Moskva, Vses.izdatel'sko-poligr. ob"edinenie M-va putei soobshcheniia, 1960. 282 p. (MIRA 13:5)
(Railroads--Baggage)

VASIL'YEV, Mikhail Vasil'yevich; VISHNYA, L.P., red.; SMIRNOV, P.S., tekhn.red.

[Vyborg] Vyborg. Lenizdat, 1958. 137 p. (MIRA 12:6)
(Vyborg)

VASIL'YEV, M.V., gornyy inzh.; KOTOV, V.N., gornyy inzh.; RUSSKIY, I.I., gornyy inzh.; KHOKHRYAKOV, V.S., gornyy inzh.; POPOV, S.L., gornyy inzh.; SHILIN, A.N., gornyy inzh.; TARAN, M.I., gornyy inzh.; SHKUTA, E.I., gornyy inzh.

"Strip mining" by M.G.Novozhilov. Reviewed by M.V.Vasil'ev and others. Gor. zhur. no.7:79-80 Jl '61. (MIRA 15:2)
(Strip mining)
(Novozhilov, M.G.)

DEMIN, A.M., kand. tekhn. nauk; KOKH, P.I.; CHERTKOV, V.K.; VASIL'YEV, M.V., kand. tekhn. nauk; YEFIMOV, I.P.; KMITOVENKO, A.T., dots.; PRISEDSKIY, G.V., inzh.; DUNAYEVSKIY, Yu.N.; VOLOTKOVSKIY, S.A., doktor tekhn. nauk; KUR'YAN, A.I., kand. tekhn. nauk; MAYMIN, A.I.; MIROSHNIK, A.M.; PETROV, I.P.; TURYSHEV, B.F.; SHISHKOV, A.I.; AVERBUKH, I.D., inzh.; VARSHAVSKIY, A.V.; KRYUKOV, D.K.; LUKAS, V.A.; MINEYEV, V.A.; SMIRNOV, A.A., otv. red.; LYUBIMOV, N.G., red. izd-va; MAKSIMOVA, V.V., tekhn. red.

[Handbook for the mechanic in a coal pit]Spravochnik mekhanika ugol'nogo kar'era. Moskva, Gosgortekhizdat, 1961. 639 p. (MIRA 15:12)

(Coal mining machinery--Handbooks, manuals, etc.)

VASIL'YEV, M.V. (Moscow)

Classification of diagrams of state of binary metallic systems in accordance with their atomic interaction forces. Zhur. fiz. khim. 38 no.4:871-877 Ap '64. (MIRA 17:6)

ACCESSION NR: AP4034576 S/0076/64/038/004/0871/0877

AUTHOR: Vasil'yev, M. V. (Moscow)

TITLE: Classification of diagrams of state of binary metallic systems according to their atomic interaction forces.

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 4, 1964, 871-877

TOPIC TAGS: phase diagram, classification, binary system phase diagram, interatomic force

ABSTRACT: The author classified the phase diagrams of binary melts according to the magnitude of the interatomic forces accounting for the basic common factor, the relationship among the forces between the like and unlike bonds, and an additional factor, the ultimate strain of the energy field or the crystal lattice of the solvent. (fig. 1). In group I the molten elements are practically insoluble in the liquid and the solid phases. In group II there is an increase in the unlike bonds in the liquid state so the liquid state is retained at temperatures below the temperature of fusion of the alloying element A, leading to the formation of a eutectic. In group Ia: with further increase in the unlike bonds an area is

Card 1/2

ACCESSION NR: AP4034576

described where two liquid layers exist whose monotectic and eutectic transformation temperatures converge. Transition from a limited diagram with a eutectic to a diagram with limited solid solutions whose concentration below the eutectic can be variable or constant is shown in group III and formation of unlimited solid solutions is represented by group IV. Thus an analysis of the phase diagrams permits one to assess the relationship of the forces between like and unlike bonds for the principal groups of binary systems. Orig. art. has: 2 figures.

ASSOCIATION: None

SUBMITTED: 28Mar63 ENCL: 02

SUB CODE: MM, SS NO REF SOV: 005 OTHER: 000

Card 2/4

"L'exploration des espaces cosmiques" (Exploration of cosmic spaces), Etudes Sovietiques (Paris) Vol. 7, No. 75, June, 1954. pp. 70-72.

Puteshestviye v kosmos (A Trip Into the Cosmos), Goskul'prosvetizdat (State Press for Literature on Culture and Education), 1955.

VASIL'YEV, Mikhail Vasil'yevich; DOBRONRAVOV,V.V., professor, doktor fiziko-matematicheskikh nauk, redaktor; GOLUBKOVA,V.A., redaktor;

[Voyages into the cosmos] Puteshestviia v kosmos. Moskva, Gos. izd-vo kul'turno-prosvetitel'noi lit-ry, 1955. 174 p. (MLRA 9:3)
(Interplanetary voyages)

VASIL'YEV, M.

"Spūtnik into Space.
Eng. translation published, Dial Press, NY, 1958.

Eval. B-3,111,152

VASIL'YEV, Mikhail Vasil'yevich; DOBRONRAVOV, V.V., prof., doktor fiziko-matemat.nauk, nauchnyy red.; GOLUBKOVA, V.A., red.; ROZEN, E.A., tekhn.red.

[Space voyages] Puteshestviia v kosmos. Moskva, Izd-vo "Sovetskaia Rossiia," 1958. 244 p. (MIRA 12:9)
(Interplanetary voyages)

29(0) PHASE I BOOK EXPLOITATION SOV/2998

Vasil'yev, Mikhail Vasil'yevich

Puteshestviya v kosmos (Space Travel) 2d ed., rev. and enl. [Moscow] Izd-vo "Sovetskaya Rossiya," 1958. 245 p. 30,000 copies printed.

Scientific Ed.: V. V. Dobronravov, Doctor of Physical and Mathematical Sciences, Professor; Ed.: V. A. Golubkova; Tech. Ed.: E. A. Rozen.

PURPOSE: The book is intended to acquaint the general reader with the history, the present state, and future prospects of space travel.

COVERAGE: This book discusses in a popular vein the history of men's interest in space travel, early developments in rockets, recent Soviet and American accomplishments in space, and speculates on the future of space flight and manned travel. No personalities are mentioned. No references are given.

TABLE OF CONTENTS:

Card 1/5

AVAILABLE: Library of Congres

AC/lsb
1-25-60

Card 5/5

VASIL'YEV, M.

Life in the cosmos. IUn.nat. no.8:1-4 Ag '60. (MIRA 13:8)
(Space flight--Physiological effect)

VASIL'YEV, M. (Moskva)

The use of sunrays. Nauka i zhyttia 19 no.9:43-46 S '60.
(MIRA 13:9)

(Solar energy)

ACCESSION NR AM5001[illegible] BOOK EXPLOITATION

Vasil'yev, Mikhail Vasil'yevich

Man goes toward the stars (Chelovek idet k zvezdam), Moscow, Izd-vo "Mashinostroyeniye", 1964, 334 p. illus. 65,000 copies printed.

TOPIC TAGS: space flight

PURPOSE AND COVERAGE: This book is an entertaining story of man's trail to the stars and his unquenchable desire to know remote worlds. From ancient legends and the space cannon of Jules Verne to the strictly scientific projects of K. E. Tsiolkovskiy, from the first [illegible] to the remarkable space epics "Vostok" with Soviet cosmonauts aboard -- the author traces the proud dream of mankind. He also tells of the future -- [illegible] -- man's flight to the stars. The riddles of the satellites of Mars, the possibility of interstellar communication, and many other interesting things are introduced to the reader.

TABLE OF CONTENTS [abridged]:

Introduction -- 9

Card 1/2